

Inner Coma Imaging of Comet Levy (1990c) with the Hubble Space Telescope

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Observations of comet Levy (1990c) were carried out with the *Hubble Space Telescope (HST)* on UT 27 Sep 1990. At that time, both the heliocentric and geocentric distances were ~ 1 AU. The comet was imaged with the *Wide Field Camera (WFC)* through both red and blue filters, which were selected to isolate continuum emission peaking sharply at the nucleus. Each *WFC* pixel is $0''.1$ on a side, corresponding to 78 km at the comet. The longest exposures (4 sec) through the red filter had sufficient signal to noise that image deconvolution could be used to recover virtually the full spatial resolution of *HST*. These images reveal a fan-shaped inner coma in which the sunward-facing hemisphere is significantly brighter (by a factor of ~ 2.5) than the tailward hemisphere, consistent with volatile sublimation occurring primarily on the dayside of the nucleus. Spatial brightness profiles perpendicular to the sun-comet line are very symmetric about the nucleus and follow a ρ^{-1} brightness distribution (where ρ is the projected distance to the nucleus) to within 100 km of the nucleus. By taking the difference between two images taken 6.5 hrs apart, we have been able to investigate quantitatively the temporal variability of the comet. These difference images show a hemispherical arc of dust propagating through the coma, which might explain the light curve variations observed during ground-based and *IUE* observations. The velocity (projected along the direction perpendicular to the line of sight) of the dust in the arc is ~ 0.16 km s $^{-1}$.